

CLAIMS

What is claimed is:

1. A code division multiple access user equipment for use in receiving a plurality of data signals received over a shared spectrum, each received data signal experiencing a similar channel response, the user equipment comprising:

means for receiving a combined signal of the received data signals over the shared spectrum;

means for sampling the combined signal at a multiple of a chip rate of the received data signals;

means for combining the multiple chip rate samples as effective chip rate samples;

means for estimating a channel response for the combined signal at the multiple of the chip rate;

means for combining the multiple chip rate estimated channel response as an effective chip rate channel response;

means for determining a spread data vector using the effective samples, the effective channel response and a fourier transform; and

means for estimating data of the data signals using the spread data vector.

2. The user equipment of claim 1 wherein the multiple chip rate samples and the multiple chip rate estimated channel response are weighted prior to combining.

3. The user equipment of claim 1 wherein the effective chip rate channel response is an effective channel response matrix.

4. The user equipment of claim 1 wherein the determining of the spread data vector uses a column of a channel response matrix derived using the effective chip rate

response.

5. The user equipment of claim 1 wherein the column is a first column of the channel response matrix.

6. The user equipment of claim 1 wherein the spread data vector determining further uses an inverse fourier transform.

7. A code division multiple access user equipment for use in receiving a plurality of data signals received over a shared spectrum, each transmitted data signal experiencing a similar channel response, the user equipment comprising:

an antenna for receiving a combined signal of the received data signals over the shared spectrum;

a sampling device for sampling the combined signal at a multiple of a chip rate of the received data signals;

a channel estimation device for estimating a channel response for the combined signal at the multiple of the chip rate; and

a single user detection device for combining the multiple chip rate samples as effective chip rate samples, for combining the multiple chip rate channel response as an effective chip rate channel response, and for determining a spread data vector using the effective samples, the effective channel response and a fourier transform; and

wherein data of the data signals is estimated from the spread data vector.

8. The user equipment of claim 7 wherein the multiple chip rate samples and the multiple chip rate estimated channel response are weighted prior to combining.

9. The user equipment of claim 7 wherein the effective chip rate channel response

is an effective channel response matrix.

10. The user equipment of claim 7 wherein the determining of the spread data vector uses a column of a channel response matrix derived using the effective chip rate response.

11. The user equipment of claim 7 wherein the column is a first column of the channel response matrix.

12. The user equipment of claim 7 wherein the spread data vector determining further uses an inverse fourier transform.